(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization International Bureau



(43) International Publication Date 15 January 2004 (15.01.2004)

PCT

(10) International Publication Number WO 2004/005360 A2

(51) International Patent Classification⁷:

C08F 10/00

(21) International Application Number:

PCT/EP2003/007485

(22) International Filing Date:

9 July 2003 (09.07.2003)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data: 60/394,614

9 July 2002 (09.07.2002) US

(71) Applicant (for all designated States except US): BASELL POLYOLEFINE GMBH [DE/DE]; Brühler Strasse 60, 50389 Wesseling (DE).

(72) Inventors; and

(75) Inventors/Applicants (for US only): RESCONI, Luigi [IT/IT]; Via Arianuova, 56/B, I-44100 Ferrara (IT). FOCANTE, Francesca [IT/IT]; Via Imbrecciata, 21, I-60024 Filottrano (IT). CAMURATI, Isabella [IT/IT]; Vicolo Mozzo della Vittoria, 2, I-44100 Ferrara (IT). GUIDOTTI, Simona [IT/IT]; Piazza della Pace, 5, I-40051 Altedo-Malalbergo (IT).

(74) Agent: COLUCCI, Giuseppe; Basell Poliolefine Italia S.p.A., Intellectual Property, P.le G. Donegani, 12, I-44100 Ferrara (IT). (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GO, GW, ML, MR, NE, SN, TD, TG).

Declaration under Rule 4.17:

— of inventorship (Rule 4.17(iv)) for US only

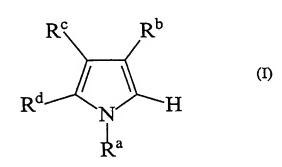
Published:

 without international search report and to be republished upon receipt of that report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.



(54) Title: CATALYST SYSTEM FOR THE POLYMERIZATION OF OLEFINS



(57) Abstract: An organometallic compound obtainable by contacting: a compound having the following formula (I), wherein: R^a is a hydrocarbon radical; R^b, R^a and R^d, are hydrogen atoms, halogen atoms, or hydrocarbon radicals; with a Lewis acid of formula (II) MtR¹₃ (II) wherein Mt is a metal belonging to Group 13 of the Periodic Table of the Elements; R¹ are selected from the group consisting of halogen atoms, halogenated C₆-C₂₀ aryl and halogenated C₇-C₂₀ alkylaryl groups.



Instructional Application No PCT/EP 03/07485

			101/11 03/	07403					
A CLASSI IPC 7	FICATION OF SUBJECT MATTER CO8F 10/00 CO7F 5/02 CO8F 4/64	5							
According to International Patent Classification (IPC) or to both national classification and IPC									
B. FIELDS	SEARCHED								
Minimum do IPC 7	cumentation searched (classification system followed by classification COSF CO7F	on symbols)							
Documentat	ion searched other than minimum documentation to the extent that s	uch documents are include	ed in the fields se	arched					
Electronic d	ala base consulted during the International search (name of data bas	se and, where practical, s	earch terms used)						
EPO-Internal, CHEM ABS Data									
			·						
C. DOCUME	ENTS CONSIDERED TO BE RELEVANT		·.	· ·					
Category °	Cliation of document, with indication, where appropriate, of the rela	evant passages		Relevant to claim No.					
X	WO 01/62764 A (BASELL TECHNOLOGY V) 30 August 2001 (2001-08-30) cited in the application claims 1-12; table			1-20					
X	WRACKMEYER, BERND ET AL: "Nuclear magnetic resonance studies on bor compounds, X. Boron-11, nitrogen-proton NMR studies on boryl-subst thiophene, furan, and N-methylpyr related systems: interaction of satoms with.pisystems" CHEMISCHE BERICHTE, vol. 109, no. 3, 1976, pages 1075 XP000916523 page 1077 - page 1082; tables 1,2	on 14 and ituted role and p2-boron -1088,		1,3,6,7					
X Furti	ner documents are listed in the continuation of box C.	X Patent family me	mbers are listed in	annex.					
'A' docume consider it docume which classo 'C' docume other it' 'P' docume later the Date of the second constant o	eare interes which may throw doubts on priority claim(s) or is cited to establish the publication date of another in or other special reason (as specified) interesting to an oral disclosure, use, exhibition or ineans and published prior to the international filling date but	r later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone of coursent of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. 3. document member of the same patent family Date of mailing of the international search report							
	nailing address of the ISA	Authorized officer		·					
	European Patent Office, P.B. 5818 Patentiaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 91 651 epo ni,	Parry. J							

Form PCT/ISA/210 (second sheat) (January 2004)





Inc. ational Application No PCT/EP 03/07485

Category *	Story DOCUMENTS CONSIDERED TO BE RELEVANT	
ategory •	Citation of document, with Indication, where appropriate, of the relevant passages	Relevant to claim No.
1	DATABASE CAPLUS 'Online! CHEMICAL ABSTRACTS SERVICE, COLUMBUS, OHIO, US; KAMAISHI, TADAMI ET AL: "Polymerization of.alphaolefin" XP002264600 retrieved from STN Database accession no. 71:92059 abstract & JP 44 013148 B (TOYO RAYON CO., LTD.)	1-20
A	12 June 1969 (1969-06-12) DATABASE CAPLUS 'Online! CHEMICAL ABSTRACTS SERVICE, COLUMBUS, OHIO, US; KAMAISHI, TADAMI ET AL: "Polypropylene" XP002264601 retrieved from STN Database accession no. 70:88432 abstract & JP 43 029756 B (TOYO RAYON CO., LTD.) 20 December 1968 (1968-12-20)	1-20
A .	DATABASE CAPLUS 'Online! CHEMICAL ABSTRACTS SERVICE, COLUMBUS, OHIO, US; KAMAISHI, TADAMI ET AL: "Crystalline polyolefins" XP002264602 retrieved from STN Database accession no. 71:22482 abstract & JP 44 006828 B (TOYO RAYON CO., LTD.) 25 March 1969 (1969-03-25)	1-20





International application No. PCT/EP 03/07485

Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)					
This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:					
1. Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:					
Cialms Nos.: because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:					
Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).					
Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)					
This international Searching Authority found multiple inventions in this international application, as follows:					
see additional sheet					
As a result of the prior review under R. $40.2(e)$ PCT, no additional fees are to be refunded.					
As all required additional search fees were timely paid by the applicant, this international Search Report covers all searchable dalms.					
2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.					
3. As only some of the required additional search fees were timely paid by the applicant, this international Search Report covers only those claims for which fees were paid, specifically claims Nos.:					
4. No required additional search fees were timely paid by the applicant. Consequently, this international Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:					
Remark on Protest The additional search fees were accompanied by the applicant's protest. No protest accompanied the payment of additional search fees.					

FURTHER INFORMATION CONTINUED FROM PCT/ISAV 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-20 (in part)

The subject matter of claims 1-20 (in part) insofar as any of Ra, Rb, Rc and Rd in the heterocyclic compound according to claim 1, formula I does not form part of a C4-C7 ring.

2. claims: claims 1-20 (in part)

The subject matter of claims 1-20 (in part) insofar as any of Ra, Rb, Rc and Rd in the heterocyclic compound according to claim 1 of formula I forms part of a C4-C7 ring.





International Application No PCT/EP 03/07485

Patent document dted in search report		Publication date			Publication date	
WO 0162764	Α	30-08-2001	AT	268779 T	15-06-2004	
			ΑU	3737301 A	03-09-2001	
			BR	0105430 A	04-06-2002	
			CA	2370799 A1	30-08-2001	
			CN	1366528 T	28-08-2002	
			MO	0162764 A1	30-08-2001	
		•	EP	1173445 A1	23-01-2002	
			JP	2003524013 T	12-08-2003	
			US	2003228976 A1	11-12-2003	
		•	US	2004030153 A1	12-02-2004	
			US	2002038036 A1	28-03 - 2002	
			ZA	200108415 A	13-01-2003	
JP 44013148	В		NONE			
JP 43029756	В		NONE			
JP 44006828	В		NONE			